d) <u>REMARKS</u>

The claims are 1-5, 8, 9, 11 and 56 with claims 1 and 56 being independent. Claims 28-34 and 39-44 were cancelled in response to the outstanding restriction requirement. Claims 1-11 are deemed elected. The subject matter of now-cancelled claims 6, 7 and 10 has been added to claim 1. Support for claim 56 and the amendments to claim 1 can be found, inter alia, on page 25, line 20, Tables 1-3 on pages 137 and 138 and claim 10. Reconsideration of the claims is expressly requested.

Claims 1, 3, 5, 6, 8 and 11 were rejected as anticipated by Ikeda '683 based on the disclosure in columns 1 and 8. Claims 2, 4, 7, 9 and 10 were rejected as obvious over Ikeda, either alone or in view of Pang, Murakami or Kikuchi. Claims 1-8 and 11 were also rejected as obvious over Parry '500 in view of LePetitcorps. The grounds of rejection are respectfully traversed.

Prior to addressing the grounds of rejection, Applicants wish to briefly review certain key features and advantages of the present claimed invention. In a conventional processing apparatus, such as a CVD apparatus or deposited film etching apparatus for formation of a semiconductor thin film, when a gas containing a silicon compound as a main component (e.g., SiH_4 gas) is typically used in processing, a powdery by-product is generated within the apparatus. The powdery by-product contaminates the deposited film formed and/or adheres to exhaust pipes or valves and blocks them. Moreover, the pressure inside the chamber is influenced by the powder and/or operational defects of the conductance adjusting valve occur.

The above-mentioned problems can be overcome by the present claimed invention. A novel exhaust processing process is provided in which a filament in a trap means is heated to a temperature from 1400°C to 2200°C. In that range not only is any non-reacted gas, but, also, any by-product is efficiently heated/decomposed and is deposited as a hard film on a trap wall surface.

In the cited prior art processes, the speed of decomposing non-reacted compound gas and depositing the decomposed gas products on a trap wall surface is relatively low. Under such processing conditions where the amount of by-products generated is relatively small, then, even when the filament temperature is as low as 500°C, as in Ikeda, both a non-reacted gas and a by-product can efficiently be decomposed and deposited as a hard film on a trap wall surface. In Ikeda, a range of 150°C-500°C is disclosed.

However, under severe processing conditions yielding a high deposition rate of deposited film, the increased amounts of by-products cannot be decomposed efficiently at a filament temperature on the order of 500°C. Thus, there is a need for a novel technique to efficiently decompose both significant quantities of non-reacted gas and by-product under stringent film-forming conditions.

Unexpectedly, the present inventors have found that by heating a high-melting filament to an elevated temperature of 1400°C to 2200°, both non-reacted gas and by-product can be efficiently decomposed and deposited as a hard film on a trap wall surface.

At the lower limit (1400°C) of the instant claimed temperature range, not only non-reacted gas, but also powdery by-product, can efficiently be decomposed. The upper limit of the claimed temperature range (2200°C) is just below the melting point of the material of the claimed filament. However, if the filament temperature is raised further, there is a possibility that the vacuum seal of the processing apparatus may be influenced (i.e., degraded or broken).

None of the cited references teach or suggest the problem of treating by-products formed under severe production conditions. The references fail to teach generation of powdery by-product, forming a deposited film of the by-product, adherence of the powdery by-product to exhaust pipes or valves which result in blocking, or the like.

As shown in Table 2 on specification page 137 and as discussed in Example 2 on pages 81-82, enhanced results are achieved at a filament temperature of at least about 1400°C (page 82, line 27 to page 83, line 1). The double circle in the Table shows that in 100 cycles no film deposition occurred on the filament and no defects were measured on the conductive adjusting valve.

As seen in Tables 2 and 3 on pages 137 and 138, when the filament temperature was as high as about 2200°C excellent results were obtained. When the filament temperature was significantly above about 2200°C, film deposition rate on the trap declined and the vacuum seal portion around the trap required cooling. The melting point of the claimed filaments is from 2620°C to 3410°C. As the filament temperature approaches these melting points even more severe problems occur.

Wherefore, none of the references disclose or suggest the claimed invention nor render it unpatentable.

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